

What is claimed is:

1. An isolated DNA comprising the sequence which codes for a mutated collagen X or a portion thereof wherein the expression of said DNA regulates bone growth.
2. The isolated DNA of claim 1, wherein the DNA comprises the sequence of Col10-13del as set forth in Figure 2.
3. A vector which comprises the DNA of claim 1.
4. A method for production of the a polypeptide which regulates bone growth comprising a host-vector system which comprise the vector of claim 3 and an appropriate host.
5. The method of claim 4, wherein the host is either a prokaryotic or eukaryotic cell.
6. The polypeptide encoded by claim 1.
7. A polypeptide comprising a portion of a mutated collagen X capable of regulating bone growth.
8. A composition comprising the polypeptide of claim 7 and a suitable carrier.
- 30 9. A pharmaceutical composition for increasing bone growth comprising the polypeptide of claim 7 and a pharmaceutically acceptable carrier.
- 35 10. A method of treating a subject afflicted with dwarfism comprising administering to the subject an amount of the polypeptide of claim 7 or the DNA of claim 1 effective to reverse the dwarfism.

11. A method of treating a subject afflicted with low bone mass comprising administering to the subject an amount of the polypeptide of claim 1 or DNA comprising the DNA of claim 1 effective to treat low bone mass in the subject.

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12. The method of claim 11, wherein the low bone mass causes osteoporosis.

10 13. A method of improving the quality and speed of bone union after fracture in a subject comprising administering to the subject an amount of the polypeptide of claim 7 or DNA comprising the DNA of claim 1 effective to improve the quality and speed of bone union.

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14. The method of claim 9, 10, or 11 wherein the DNA is operatively linked to inducible regulatory element.

20 15. A transgenic animal comprising an the DNA of claim 1.

16. The transgenic animal of claim 15, wherein the animal is a mouse.

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17. A transgenic animal comprising an DNA designated Col10-13del as set forth in Figure 2.

18. A method for identifying whether an agent which stimulates bone growth comprising steps of:

30 a) administering the agent to the transgenic animal of claim 15; and

b) examining the transgenic animal after the administration of the agent to determine whether bone growth has been stimulated.

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19. A method for assessing the effect of surgery on

increasing bone length comprising steps of:

- a) performing surgery on the transgenic animal of claim 15; and
- b) assessing the increase in bone length of the animal to determine the effect of surgery on said animal.

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20. A method for assessing the effect of bone growth stimulating agents on fracture repair comprising steps of:

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- a) creating a fracture repair in the transgenic animal of claim 15;
- b) administering the agent to the transgenic animal; and
- 15 c) examining the transgenic animal after the administration of the agent to determine whether bone growth has been stimulated.

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